

App. No. 09/882,076
Amendment Dated: February 3, 2006
Reply to Office Action of August 4, 2005

Listing of Claims:

Claim 1 (currently amended): A computer-implemented method for adaptively throttling a computer, comprising:

measuring a prior utilization of the computer while a CPU of the computer is idle, wherein the prior utilization is measured by resolving user time, kernel time, and idle time within a time period into a utilization percentage that corresponds to the prior utilization, and wherein the CPU is considered to be idle despite the CPU polling for work and checking for pending deferred procedure calls; and

if the prior utilization crosses a threshold, modifying a parameter associated with the CPU.

Claim 2 (previously presented): The method of claim 1, wherein the parameter comprises a clock frequency.

Claim 3 (original): The method of claim 1, wherein the parameter comprises a voltage.

Claim 4 (original): The method of claim 1, further comprising:
storing the prior utilization in a utilization history database.

Claim 5 (original): The method of claim 4, further comprising:
accessing the utilization history database to determine if the CPU has been at a performance level for a sufficient period of time.

Claim 6 (original): The method of claim 1, wherein the threshold indicates that a performance level allocated with the CPU should be increased.

Claim 7 (original): The method of claim 6, further comprising:
applying a system policy to determine whether to increase the performance level of the CPU.

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Claim 8 (previously presented): The method of claim 7, wherein the system policy comprises a heat performance limit related to a temperature sensed near the CPU.

Claim 9 (previously presented): The method of claim 7, wherein the system policy comprises a battery performance limit related to a battery level of a battery supplying the computer with power.

Claim 10 (previously presented): The method of claim 7, wherein the system policy relates to a switching latency of the CPU.

Claim 11 (currently amended): A computer-readable medium having at least one physical media, the computer-readable medium having computer-executable instructions for adaptively throttling a computer including a CPU having a CPU performance level, comprising:
calculating a prior utilization of the CPU while the CPU is idle, wherein the prior utilization is measured by resolving user time, kernel time, and idle time within a time period into a utilization percentage that corresponds to the prior utilization, and wherein the CPU is considered to be idle despite the CPU polling for work and checking for pending deferred procedure calls; and

calculating a utilizable CPU performance level using the prior utilization.

Claim 12 (original): The computer-readable medium of claim 11, further comprising:
calculating a thermal CPU performance limit using temperature information associated with the CPU; and

changing the CPU performance level to a minimum of the utilizable CPU performance level and the thermal CPU performance limit.

Claim 13 (previously presented): The computer-readable medium of claim 11, further comprising:

calculating a battery CPU performance limit using battery charge information associated with a battery supplying power to the CPU; and

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if the battery CPU performance limit is less than the utilizable CPU performance level and the battery CPU performance limit is less than the thermal CPU performance limit, changing the CPU performance level to the battery CPU performance limit.

Claim 14 (original): The computer-readable medium of claim 11, further comprising:
changing the CPU performance level to the utilizable CPU performance level.

Claim 15 (previously presented): The computer-readable medium of claim 12, wherein changing the CPU performance level occurs at an expiration of a timer.

Claim 16 (original): The computer-readable medium of claim 15, further comprising:
if the minimum performance level is equal to a maximum performance level of the CPU, disabling the timer.

Claim 17 (original): The computer-readable medium of claim 15, further comprising:
if the new performance level is less than a maximum performance level of the CPU, resetting the timer.

Claim 18 (currently amended): A system for adaptively throttling a computer including a CPU having a CPU performance level, comprising:

a CPU utilization monitor configured to monitor a utilization of the CPU, wherein a prior utilization for the CPU is measured by resolving user time, kernel time, and idle time within a time period into a utilization percentage that corresponds to the prior utilization;

a CPU throttler configured to perform the adaptive throttling of the CPU based on information from the CPU utilization monitor; and

a timer configured to monitor a time since an idle state, wherein the CPU throttler is activated when the CPU enters an idle state, and wherein the CPU is considered to be in idle state despite the CPU polling for work and checking for pending deferred procedure calls.

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Claim 19 (previously presented): The system of claim 18, wherein the CPU is activated when the time since the last idle state exceeds a threshold.

Claim 20 (previously presented): The system of claim 18, further comprising:
a thermal policy manager configured to monitor a temperature near the CPU
wherein the thermal policy manager activates the CPU throttler when the temperature crosses a threshold.

Claim 21 (previously presented): The system of claim 18, further comprising:
a degradation policy manager configured to receive a charge level from a battery sensor monitoring a battery wherein the degradation policy manager activates the CPU throttler when the charge level crosses a threshold.

Claim 22 (previously presented): The system of claim 18, wherein the CPU throttler changes the CPU performance level in response to a utilization of the CPU measured by the CPU utilization monitor.

Claim 23 (previously presented): The system of claim 18, wherein upon activation, the CPU throttler resets the timer.